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(19) (CA) APPLICATION FOR CANADIAN PATENT (12)

(54) Leather Hide Cutting Method

(72) Etcheparre, Jean - France ;  
Etcheparre, Bernard - France ;

(71) Lectra Systèmes S.A. - France ;

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Notice: This application is as filed and may therefore contain an  
incomplete specification.

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ABSTRACT OF THE DISCLOSURE

A method of automatically cutting up leather hides (3) comprising the successive operations of digitally recording the flaws (2, 2') and the outlines of the hide, 5 identifying the hide, and transferring and placing said hide on a cutting-up work bench, the method being characterized in that the transfer operation is performed by removably fixing said hide on a semi-rigid support (1) 10 suitable for being rolled up together with the hide without causing relative displacement between the hide and the support, and in such a manner as to enable the cut-out pieces to be unstuck from the support without damaging the hide and without marking it.

A METHOD OF CUTTING UP LEATHER HIDES

The present invention relates to a method of automatically cutting up leather hides, the method including, in particular, a step of transferring and  
5 optionally storing said hides, the invention also providing apparatus for transferring and storing hides.

At present, most of the industry uses a manual method of cutting up leather hides which consists in identifying flaws in the hide by means of chalk marks, in  
10 spreading the hide out on a work bench, in positioning hollow punches on the hide, while taking account of its flaws and of the way it is spread, then bringing the bench under a press that presses the hollow punches down, thereby making cutouts in the hide. That method makes it  
15 possible to obtain cuts that are of high quality, but unfortunately at a very low level of productivity.

FR-A-2 605 513 describes the constitution of a cutting support adapted to a cutting-up method. That cutting-up machine comprises a plurality of moving work  
20 benches forming an endless chain or conveyor that moves along five workstations. Each support work bench is constituted by plates of soft material (polystyrene, polyurethane). However, that document does not provide for any detachable fixing between the support surface and  
25 the hide, nor does it provide for said surface being rolled up. Furthermore, the described work benches are bulky and they do not enable the manufacturing cycle to be split up into self-contained stages.

For the purpose of considerably improving  
30 productivity, the automatic cutting-up method generally comprises a step consisting in identifying flaws in the hide by means of chalk marks, in spreading the hide out on one of the moving work benches of a digitally controlled automatic cutting machine, and then in  
35 digitizing a computer image of the shape of the hide, the image taking account of the identified flaws. From this moment, in order to enable the hide to retain the shape

2095934

it had while digitizing was taking place, the hide must not be moved until it has been cut up, which is why apparatuses implementing the above method use a plurality of moving work benches that move from workstation to workstation. The following step consists in placing the shapes to be cut out in the digitized image, with this operation being performed by means of graphic placement software. Thereafter, the work bench supporting the hide is taken to the cutting zone of the machine. Once cutting has been performed and the pieces have been removed from the work bench, the work bench can return to the digitizing zone where an operator will spread out a new hide thereon.

For reasons of productivity, such apparatuses are fitted with at least two moving work benches. The above design must make it possible for the laying, digitizing, and placing operations concerning to the hide to be performed in masked time relative to the cutting operation. In addition, the moving work benches must be very large (about 3 meters (m) by 3 m) since each of them must enable an entire hide to be spread out thereon. The size of such work benches means that the automatic machine necessarily takes up a very large amount of space, which leads to installation difficulties. In prior methods, it is impossible to remove a hide from its work bench after it has been digitized since hides are sufficiently flexible to make it impossible to conserve the shape of which a computer image has been obtained. Furthermore, when a hide is spread out on a work bench, there are always folds that occur in the hide and that spoil the quality of the cutout shapes.

An object of the invention is to solve the above difficulties or at least to attenuate them.

According to the invention this object is achieved by a method of automatically cutting up leather hides comprising, in a first workstation, successive prior operations of digitally recording flaws and outlines of

2095934

the hide, of identifying the hide, of graphically placing the shapes to be cut out, of transferring said hide from the first station and of positioning it on a cutting-up work bench, the method being characterized in that prior  
5 to performing the recording operation, said hide is detachably fixed on a semi-rigid uniform support whose area is determined as a function of the size of the hide and which is suitable for being rolled up with the hide without causing relative displacement between the hide  
10 and the support such that cut-out pieces can be unstuck without damaging the hide and without marking it.

According to another characteristic of the invention, after the operations performed in the first workstation, the operation of storing the rolled up  
15 supports is performed for the purpose of cutting out at a later time.

The invention also provides apparatus for transferring and storing a hide, the apparatus comprising support and immobilization means for supporting and  
20 immobilizing said hide whose flaws and outlines have been digitally recorded prior to an automatic cutting-up operation, the apparatus being characterized in that said support and immobilization means comprise: a semi-rigid uniform support surface in adhesive contact with the hide  
25 at all points where their respective faces face each other, thereby enabling the hide to be immobilized by being detachably fixed on said surface and enabling said surface to be rolled up with the hide without causing relative displacement between the hide and the surface;  
30 and positioning members enabling the position of the support surface on the cutting-up work bench to be identified.

According to another characteristic, the apparatus further includes means for identifying said hide and  
35 constituted, in particular, by information-presenting elements such as labels fixed on the support surface.

2095934

The invention makes it possible to "freeze" the shape of the hide without using the system of moving work benches and it makes it possible to transfer leather hides between all of the steps of the cutting-up method that follow the operation of digitizing the shape of the hide.

The invention will be better understood on reading the following description and the accompanying drawings, in which:

Figure 1 is an overall view of a leather hide on its support and immobilization means; and

Figure 2 is a diagram of the method of the invention for cutting up leather hides.

Figure 1 shows support and immobilization means comprising a semi-rigid uniform support 1 on which the leather hide 3 is immobilized, with the flaws in the hide being identified by marks 2 and 2'. Immobilization is achieved by detachable or adhesive contact between said support and the hide over all points where they have respective faces facing each other.

The semi-rigid material constituting the surface of the support 1 is selected in such a manner as to enable it to be rolled up with the hide and subsequently return to a plane shape.

In addition, its color is selected so as to obtain the best possible contrast with the hide it supports, for the purpose of facilitating digitizing the outline of the hide.

Information such as the area, the color, the quality, and the date on which the hide 3 fixed to the support 1 was digitized is marked on identification means such as a label 5.

The apparatus shown also includes positioning members such as a reference marker enabling the position of the support surface 1 relative to the cutting-up work bench to be identified.

2095934

The positioning of the hide 3 (outlines and flaws) relative to the support 1 is determined by the digitizing machine 7 shown in Figure 2. The positioning may be determined relative to the edges of the support surface 1 which serve to provide an orthogonal frame of reference having one of the corners of the surface as its origin. The shapes to be cut out are then placed graphically on the digitized image of the hide, taking account of its outlines and flaws. Thereafter, an angle bracket fixed on the cutting-up work bench is used to receive one of the corners of the semi-rigid support surface so that said hide-supporting surface is placed on the cutting-up work bench in the same position as it occupied when the outlines and flaws were recorded digitally. The bracket may be constituted, for example, by means of two strips at an angle of  $90^\circ$  to each other. This solution has the advantage of not limiting the format of the support surface which may thus vary as a function of hide size.

This embodiment makes it possible firstly to find directly the exact positions of the pieces to be cut out without making a new recording, and secondly to initialize the cutting-up machine relative to the support surface.

In another embodiment, said positioning members are constituted by sticky shapes 4 applied to the support and whose positions are recorded during digitizing.

The operator then initializes the cutting-up machine by aligning such markers with aiming means fixed on the cutting head.

According to the cutting-up method of the invention, and as shown in Figure 2, the operator takes a leather hide from a storage stand 6 and then fixes said hide on the semi-rigid support surface 1 using a coating that is essentially constituted by a transient adhesive, the operator spreading out the hide so as to make it as plane as possible. The "transient" adhesive is selected in such a manner as to ensure that it is possible to unstick

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cut-out pieces of hide from the support surface without damaging the hide and without marking it. Thereafter the operator runs the digitizing system 7 which makes a computer image of the outline of the hide, taking account  
5 of the marks 2, 2' that identify flaws.

While still fixed in detachable manner on its semi-rigid support 1, the leather hide 3 is rolled up so as to be transported and then stored in a waiting station 8, prior to being cut up.

10 The adhesive contact between the surface of the support and the hide makes it possible to immobilize the hide and to roll up the assembly without any kind of relative displacement taking place between the hide and its support.

15 Information concerning the hide 3 is previously marked on the support 1, e.g. by means of information-presenting elements such as adhesive labels 5 that are printed automatically and then stuck close to the corner of the support surface which the operator is to position  
20 in the bracket formed on the cutting-up work bench.

The computer power containing the digitized image of the outline of the hide is then stored, e.g. on a floppy disk, prior to being recovered in a computerized placement graphics station 9. An operator working at  
25 said station then proceeds to place the shapes that are to be cut out on the digitized image of the outline of the hide as transmitted thereto.

The computer file containing cutting-up information that results from the previously-performed placement is  
30 stored in turn and subsequently transmitted to the automatic machine 10 that performs cutting-up.

In order to cut up the hide and the support assembly  
11 under consideration, the operator of the automatic cutting-up machine must initially recover the roll 11  
35 from the stock in the waiting station 8, and then use the positioning members to position it on the cutting-up plane which is constituted by a fixed work bench.



2095934

Thereafter the cutting-up file from the placement station 9 is loaded into the digital control means of the cutting-up machine 10.

In this way, since all of the steps in the  
5 production cycle are independent, the above-described cutting-up method is more flexible in use, while also having the advantage of using a plurality of relatively small elements, thereby making installation easier. In  
10 addition, since the hide is properly spread out and fixed on its support, the quality and the accuracy of cutting out are often improved. Similarly, the work of placing large hides on the cutting-up plane is greatly  
facilitated since they are glued to the semi-rigid support and the operator merely needs to roll out the  
15 support/hide assembly and then slide it about to put it into position.

Another advantage is that the quality of digitizing can be considerably improved if the color of the semi-rigid support is chosen as to as to obtain the best  
20 possible contrast with the color of the hide.

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## CLAIMS

1/ A method of automatically cutting up leather hides (3) comprising, in a first workstation, successive prior operations of digitally recording flaws (2, 2') and outlines of the hide, of identifying the hide, of graphically placing the shapes to be cut out, of transferring said hide from the first station and of positioning it on a cutting-up work bench, the method being characterized in that prior to performing the recording operation, said hide is detachably fixed on a semi-rigid uniform support (1) whose area is determined as a function of the size of the hide and which is suitable for being rolled up with the hide without causing relative displacement between the hide and the support such that cut-out pieces can be unstuck without damaging the hide and without marking it.

2/ A method according to claim 1, characterized in that after the operations performed in the first workstation, the operation of storing the rolled up supports is performed for the purpose of cutting out at a later time.

3/ A method according to claim 1 or 2, characterized in that the identification operation is performed by associating an information-presenting element with said support (5).

4/ A method according to any one of claims 1 to 3, characterized in that said hide is positioned on the cutting-up work bench using a reference mark associated with the support (1) and digitally recorded with the hide (3) making it possible firstly to recover directly the exact position of the pieces to be cutout without further recording, and secondly to initialize the cutting-up machine relative to the surface of the support.

2095934

5/ Apparatus for transferring and storing a hide (3), the apparatus comprising support and immobilization means for supporting and immobilizing said hide whose flaws (2, 2') and outlines have been digitally recorded prior to an automatic cutting-up operation, the apparatus being characterized in that said support and immobilization means comprise:

- 10 a semi-rigid uniform support surface (1) in adhesive contact with the hide (3) at all points where their respective faces face each other, thereby enabling the hide to be immobilized by being detachably fixed on said surface and enabling said surface to be rolled up with the hide without causing relative displacement between the hide and the surface; and
- 15 positioning members enabling the position of the support surface on the cutting-up work bench to be identified.

20 6/ Apparatus according to claim 5, characterized in that the semi-rigid support surface (1) is made of a material that enables it to be rolled up and subsequently to return to a plane shape, and of a color that provides the best possible contrast with the hide.

25 7/ Apparatus according to claim 5 or 6, characterized in that the adhesive contact between the support surface (1) and the hide (3) is achieved by means of a coating essentially constituted by a "transient" adhesive enabling cut-out pieces to be unstuck without marking the

30 hide.

8/ Apparatus according to any one of claims 5 to 7, characterized in that it further includes means (5) for identifying said hide and constituted, in particular, by

35 information-presenting elements such as labels fixed on the support surface.

9/ Apparatus according to claim 5, characterized in that said positioning members are constituted by a sticky shape (4) applied to the support, with the position thereof being recorded during digitizing; the operator  
5 subsequently initializing the cutting-up machine by aligning said mark with aiming means fixed on the cutting head.

10/ Apparatus according to claim 5, characterized in that  
10 said positioning means are constituted by an angle bracket fixed on the cutting-up work bench to receive one of the corners of the semi-rigid support surface as marked by a label (5) so that said hide-supporting  
15 surface is placed on the work bench in the same position as it occupied while its flaws and outlines were being suitably recorded.

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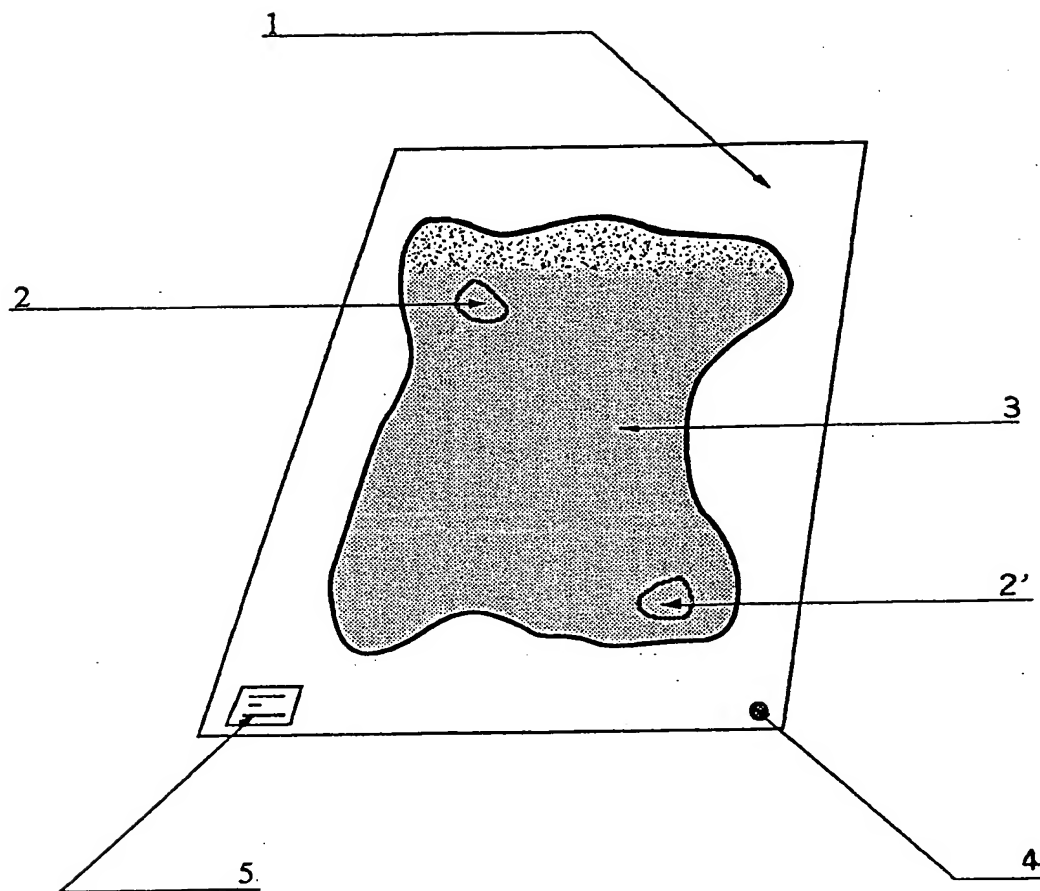


FIGURE 1

McCARTHY, TAYLOR & BOLT  
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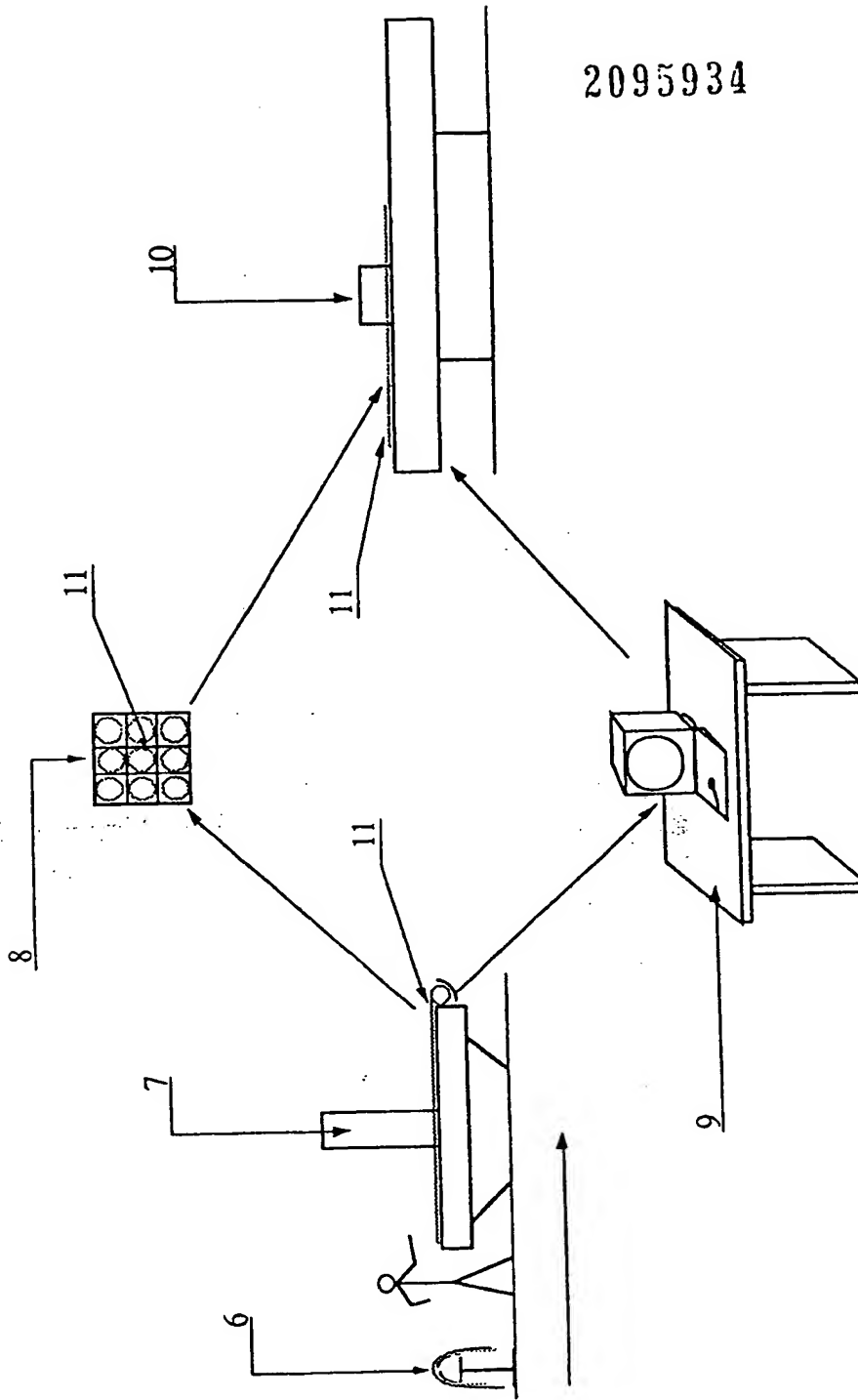


FIGURE 2

MCCARTHY TEST MVT  
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